University of Agronomic Sciences and Veterinary Medicine of Bucharest
Faculty of Horticulture

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Research on the design, implementation, operation and impact that small ornamental and utility gardens have on children and families in need.

Authors names: **Gabriel Cristian MILOȘ**
gabrielmilos@pozitiv.ro
Cristina Florentina ION
ioncristinaflorentina@gmail.com

Coordinator Professor: **George Adrian PETICILĂ**
adrian.peticila@horticultura-bucuresti.ro

Introduction

In 2019, together with a team of students from the Faculty of Horticulture within USAMV Bucharest coordinated by Professor Adrian Peticilă, we set up a garden at SOS Children's Villages Romania, Bucharest. The garden was divided into 4 areas and horticultural species were planned, the necessary activities from design to maintenance, but also the evaluation of results and impact on children taking into account cognitive and emotional progress, application of knowledge acquired at school, skills development as well as the therapeutic part of horticultural activities.

Through open discussions and practical activities, the children gained theoretical knowledge, but especially acquired practical skills in the field of gardening, horticulture, electronics and automation, of circuits in nature the role of resource recirculation, such as rainwater, compost, material recovery. The new sensory elements helped them to make progress in the therapeutic area as well, of acquiring well-being, relaxing and diminishing behaviors related to hyperactivity and lack of concentration, partly caused by the situation of vulnerability in which they find themselves.

Introduction

The recorded data included a sample of 20 children out of about 50 in the village of SOS in Bucharest. Along the way, data were recorded on plant recognition as well as the number of children who participated and successfully performed a series of practical activities in the garden.

In the future, we intend to deepen research on the reuse of natural resources, garden automation and study the effect of horticultural practices in small gardens on children and adults interested in nature, but especially those in communities in need.

Materials and Methods

4 areas were organized:

- Area A - 6 x 3m with containers of 10 - 20 liters in which dwarf vegetables, aromatic and ornamental plants, cut flowers were planted. The containers were grouped 4 - 5 / sqm, and each group had a protection against the sun's rays consisting of a wooden frame (h = 30 cm) consisting of recycled panels and painted with the help of children.

- Zone B - row 20 m long - planting in 20 liter containers - undetermined tomatoes, cucumbers, kiwano, bitter cucumbers. The containers were insulated, 1 meter away from each other, without protection from solar radiation.

Materials and Methods

- Zone C - 2 double rows of 20 meters each with the planting of seedlings in the garden soil. On row 1, only tomato species and hybrids were planted. In the 2nd row were planted pumpkins, okra, eggplant, peppers, squash, snake squash. a Mulching with agrotextile + vegetable chop.

- Zone D - 1 row of 10 meters with fruiting shrubs - blackberry, raspberry, blueberry.

All areas were mulched with agrotextile + vegetable chop and drip irrigated. Drip flow - 4 liters / hour, irrigation timer that started in the morning between 5 - 5.30, every 2 days.

In August, irrigation was carried out every day.

Materials and Methods

Fertilizers - for vegetables and herbs - BĂLŢATA, 4-4-4 NPK, MgO 1%, SO_3 1% + microelements - fermented fertilizer, pelleted, containing microelements, obtained from cattle manure / manure.

It was used as a basic fertilizer - 2 tons / ha, respectively 10 kg / 50 sqm for plants grown in soil.

For plants grown in containers - 500 grams / plant / season, respectively 200 grams at planting (May) and 100 grams every 4 weeks (June - August).

The bark mulch applied to each container as well as the vegetable chop also brought a supply of organic elements in the soil and substrate.

In the next production cycle, compost of own production will be used.

Materials and Methods

The organic treatments were carried out with botanical extracts of natural origin, preventive and curative for areas B, C and D, with a dose of 0.3%, every month between May and August with Atlantica Agricola products, being prepared for the following diseases and pests:

1. Powdery mildew → Mimoten 0.3% + Zytron 0.15% or Canelys 0.3% + Zytron 0.15%

2. Gray rot (Botrytis sp.), Brown spot (Alternaria), Fusarium (Fusarium) + Rhizoctonia, Late Blight, Sclerotinia, Bacteriosis → Flame 0.3% or Mimoten 0.3% + Zytron 0.15%

3. White Fly, Thrips, Aphids, Mining Larva, Absolute Tuta, Caterpillar → Oleorgan 0.3% + Carbon 0.3% or Konflic (including for wireworms).

Materials and Methods

Ingredients:

Mimoten → fungicide - extract Mimosa Tenuifolia 80%,

Zytron → fungicide - citrus extract 20%,

Canelys → acaricide - cinnamon extract 70%,

Flame → fungicide / bactericide - Cu oxychloride 20%.

Oleorgan → insecticide 40% saponified neem oil,

Kabon → insecticide - 50% potassium salt,

Konflic → insecticide - 50% Quassia Amara extract + 50% potassium salt,

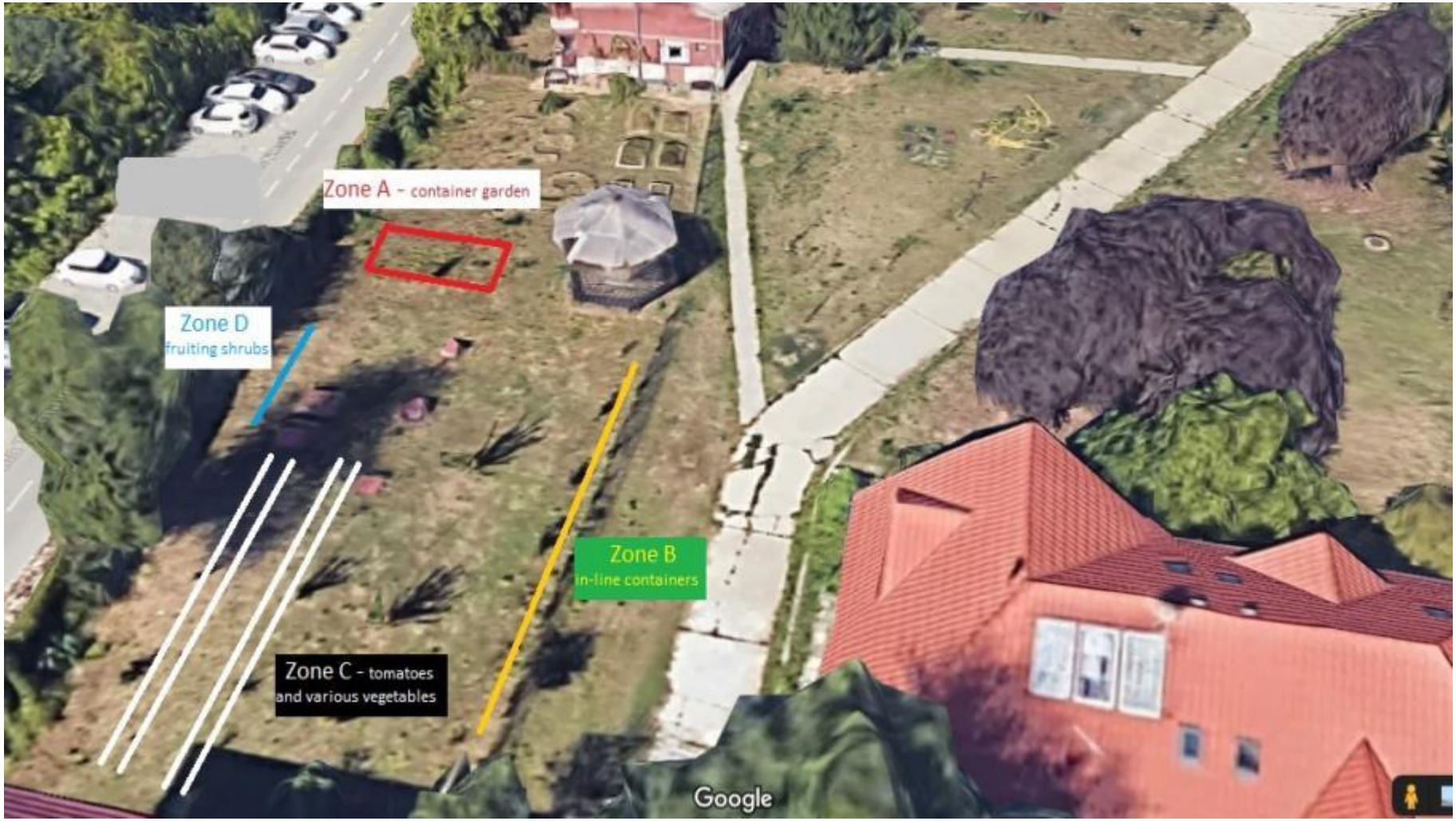
For zone A, containers with dwarf vegetables, spicy and ornamental plants, we did not perform treatments and we will see how effectively and efficiently it protects aromatic plants.

Materials and Methods

Impact measurement - sample of 20 children

A) Plant species recognition (2 interviews - July and August)
B) Performing practical tasks related to the establishment and maintenance of the garden (continuous evaluation)

Ploieşti
Brazii de Sus
Adâncata
Snagov
Fierbinţi-Târg
Buftea
Otopeni
SOS Satele Copiilor
Bucureşti
Budeşti
Comana
Greaca
SOS Garden
SOS Satele Copiilor
Şoseaua Fabrica de Glucoză
Calea Floreasca
Strada Târmului
Grădiniţa 283
Strada Târmului
Coordinates - 44°28'33.1"N 26°06'01.6"E


Zone A – container garden
Zone D
fruiting shrubs
Zone B
in-line containers
Zone C – tomatoes
and various vegetables
Google

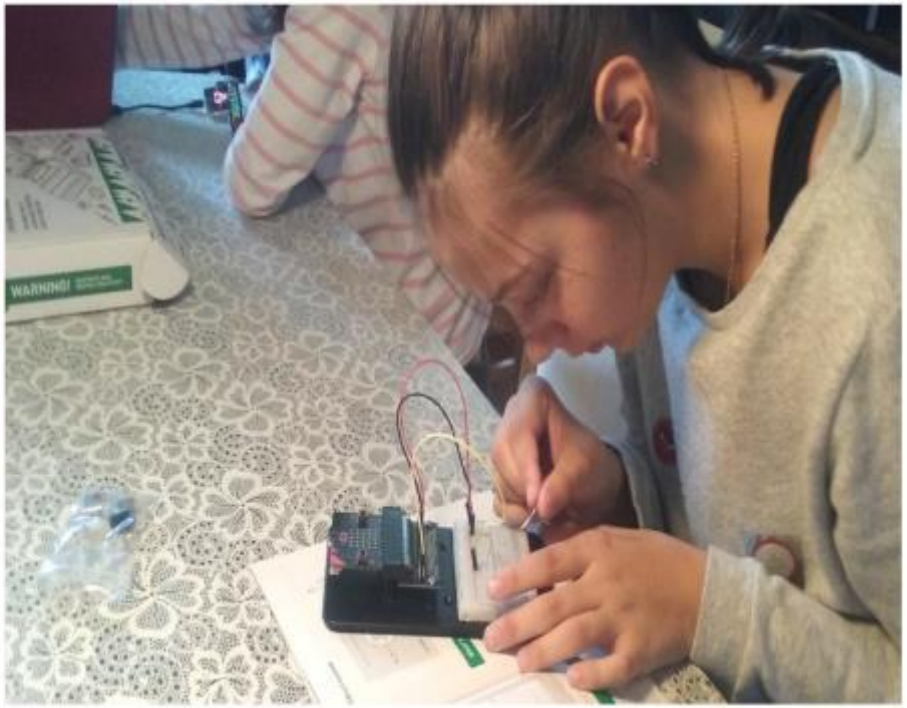
Horticultura Circulară pentru Copii, USAMV Bucuresti
Circular Horticulture for Children
The project proposes to continue the activities carried out in a garden, set up in a village of children who can no longer live with their parents, by adding new circles to horticulture and environmental sustainability, through children direct involvement.
This project can be developed in hundreds or even thousands of such villages or schools in the world.

We intend to involve children in carrying out a project of reintroducing the meteoric water collected from the roofs in a vegetable garden and flowers.

Meteoric waters are considered waste for which taxes are paid .

The project involves a water collection system, reservoirs, pump, battery and solar panel, as well as a microcontroller programmed to collect data from the sensors installed in the garden and transmit them via the Internet to mobile phones.

From there, the data are processed using a computer program made by children with the help of a teacher and certain irrigation decisions are made.



The level of innovation is high, as in addition to reducing consumption, children will have the opportunity to venture into areas of the great future, such as the Internet of Things and Big Data, where they will discover what sensors do and how to process large volumes of data collected by sensors in order to improve the environment and people's lives in general.

A professor from the Faculty of Horticulture gives a helping hand to children and plants in setting up a garden. Personal example is one of the strongest anchors for future gardeners. Several students of the Faculty of Horticulture actively participated in the establishment and maintenance of different types of gardens, closing a circle of mutual benefits student - child.

3 x 6 m = 18 sqm potager garden style, with herbs, patio vegetables, pot and cut flowers grown in islands of 10 to 20 litres nursery containers, protected by recycled wooden frames.

Flanked by skyscrapers, a garden comes to life. On 2 plots of 1 x 20 m, covered with foil against weeds will be grown vegetables irrigated by drip tubes. The palisade system for tomatoes is installed on the right.

Laying the pots in the final position.

Installation of the drip system

Gardeners know that they need to help each other in order to succeed, and climbing plants receive reliable support. Circles of trust and the application of knowledge in practice are opening up.

Patio vegetables, herbs and cut flowers are in progress, it short time children will make them shine.

Circular horticulture also involves the enhancement of the aesthetics of flowers for cutting and the development of children's artistic sense.

The bouquets were offered to social mothers contributing to the strengthening of emotional ties, the children having the chance to give something in which they invested creativity, skill and emotions.

In addition, children have learned to recognize a variety of species, to harmonize different colors, textures, scents and heights, essential skills if they want to pursue a career in the exciting field of floristry.

Flowers all year round, now in the form of floral jewelry.

Children from disadvantaged communities, but who are not residents of the Village, discover the miniature aesthetics and the technique of floral jewelry, developing their self-confidence.

Thus, the horticultural circle starts today and will close somewhere in the future.

Constant efforts, knowledge, enthusiasm and emotions find their fulfillment.
The mother of all horticultural circles is harvest time.

The practice of horticulture students not only brings beauty but opens a door to the future. Moments of joy with children are part of a very special circle.

SOS Satele Copiilor Romania
23 ore ·
La gradinarit, in Satul SOS Bucuresti. #mancaresanatoasa
#educatie #varainsat

There is no recycling circle such as the composting circle, the organic raw material for the next production cycle.

At the same time, some unused pallets received a new life.

November has arrived, the garden is preparing for winter,
what else can we do? Wow, we're just getting started!

Din luna octombrie, copiii lucrează la construirea unui robot care să îi ajute la grădinărit, alături de **Gabriel Miloș**, voluntar în Satul SOS București.

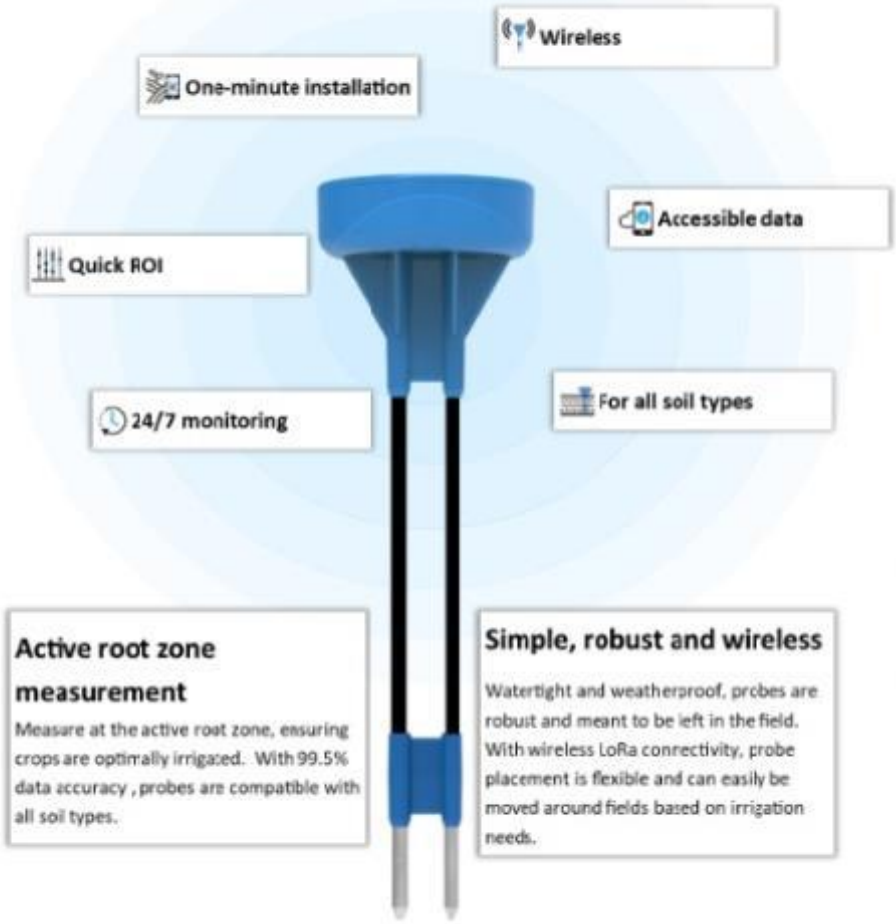
We start with understanding and building electronic circuits. We do not forget to have fun, relaxation being another indispensable and motivating horticultural circle for children.

Two or more <u>recycled</u> FOOD GRADE water containers.
Capacity - 1,000 litres for each container.

12 V water pump + battery + controller

50 W solar panel

Thanks for this example to - https://www.instructables.com/id/Green-Solar-Water-Barrel-Version-2/


Wireless
One-minute installation
Accessible data
Quick ROI
24/7 monitoring
For all soil types
Active root zone measurement
Measure at the active root zone, ensuring crops are optimally irrigated. With 99.5% data accuracy, probes are compatible with all soil types.
Simple, robust and wireless
Watertight and weatherproof, probes are robust and meant to be left in the field. With wireless LoRa connectivity, probe placement is flexible and can easily be moved around fields based on irrigation needs.

Dutch design made in Europe

Sensoterra is the robust, simple and fully wireless solution to soil moisture measurement for agriculture, horticulture, orchards and landscaping.

Wireless, IoT Technology

This gateway uploads the data to the **cloud**, and is capable of managing an unlimited number of wireless soil moisture sensors. The revolutionary Sensoterra soil moisture solution is **self-sustaining, wireless and remote.**

Remember we also thought about garden robots?

We managed to bring the children from the Village and those from the Youth Centers to a robotics demonstration organized by a top team in Romanian robotics - Dark Angels.

Children and teenagers were very interested and things started to get better and better.

But this was happening at the beginning of March 2020, and the times were impatient.

The pandemic hits hard, and the connections with the Village are closed, the children no longer have access to the garden, the people from outside the Village do not.

Will we have another garden in 2020?

But life goes on, and in May 2020, we brought the children seedlings for the new season. They planted them and took care of them further.
With the first favorable opportunity we will start the automation of the garden, so necessary nowadays, both for efficiency and recycling of resources, for a healthy food, but also for the emotional and professional development of children in future fields, such as computer science, IoT, big data, wireless communication or cloud computing.
We call this - the extended circles of horticulture.

How well the children, mothers and other kind people in the village did, you can see in the above photos - **July 20, 2020**.

So wonderful things can be done from a distance, because the **seeds sown in people** in the past years are emerging with more vigor. and they make us confident that we can achieve results in many similar places in the world.

If it is supported by skilled and kind people, **the future can grow very well!**

DEZVOLTAREA
DURABILĂ
ROMÂNIEI
2030
2030 ÎNCEPE ACUM
3 x 6 m = 18 sqm potager garden style, with herbs, patio
grown in islands of 10 to 20 litres nursery containers, pr

NL Kingdom of the Netherlands
MEGA IMAGE
DIPLOMĂ
se acordă echipei proiectului:
Horticultura Circulară pentru Copii
din cadrul: USAMV București
Premiul pentru proiectul cel mai
DESCHIS CĂTRE COMUNITATE
și pentru promovarea gândirii circulare încă din copilărie
The Circular Agriculture Challenge 2019 - 2020
Data:
22.07.2020
R. S. van Es
Roelof van Ees
Ambasador al Regatului Țărilor de Jos București

Results and discussions
Activity A - Plant species recognition

Sample - 20 children, 2 interviews in July - August

- Recognition of vegetable plants

  Tomatoes, cucumbers, peppers - 95% / eggplant (dwarf) 80%, pumpkin 70%, herbs - 40%, okra - 10%.

- Recognition of ornamental plants - flowers for pots and borders

  Petunias, pots - 80% / chrysanthemum - 75%, carnation - 65%

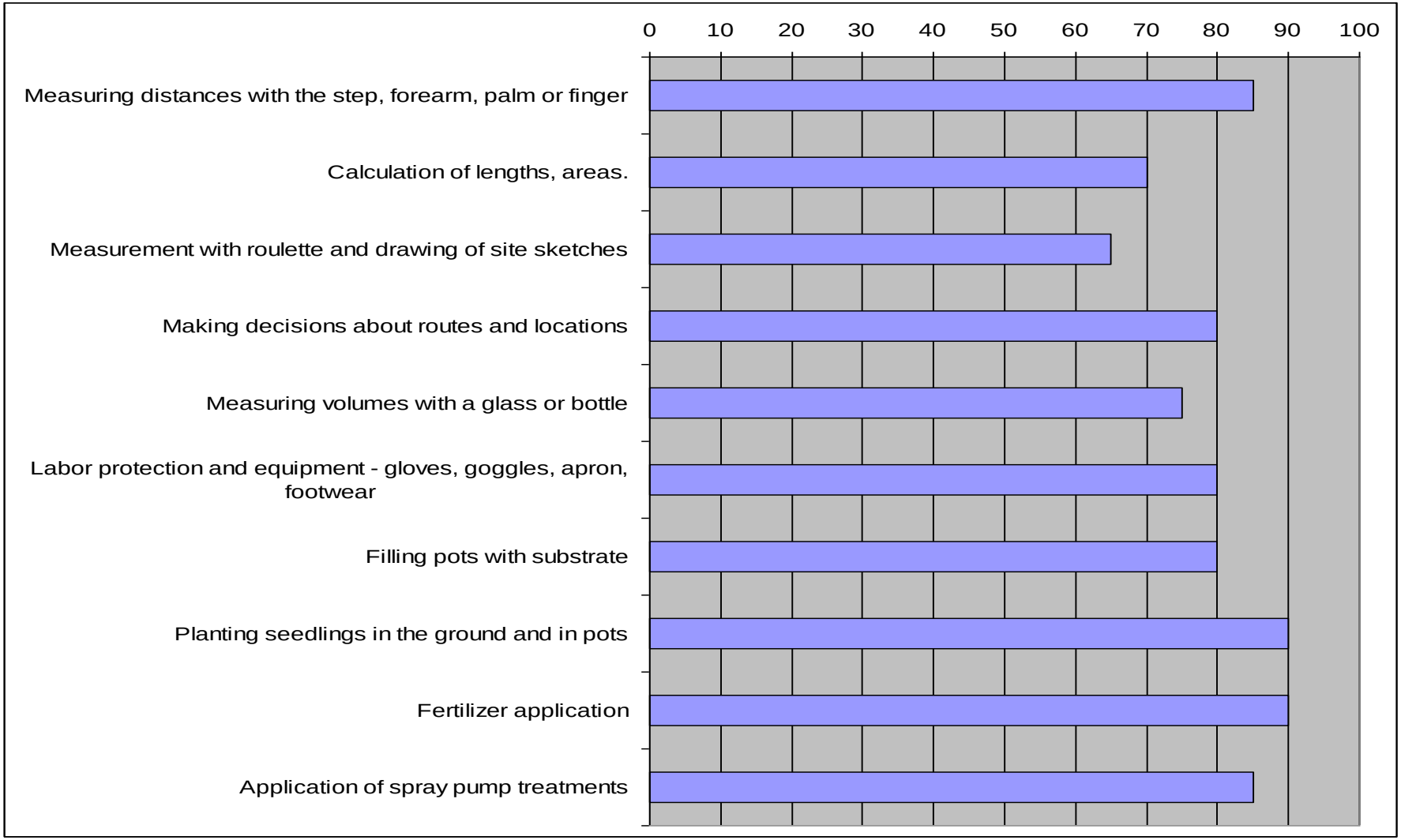
- Recognition of ornamental plants – cut flowers

  Roses - 90% / Celosia - 50% / Amaranthus - 35%, Cosmos - 20%

- Recognition of aromatic plants by appearance, aroma, taste

  Parsley, dill, basil - 75% / Locust - 65%, Thyme - 50%, Tarragon - 10%

Results and discussions - Activity B - Practical tests
Children who have completed the tasks satisfactorily



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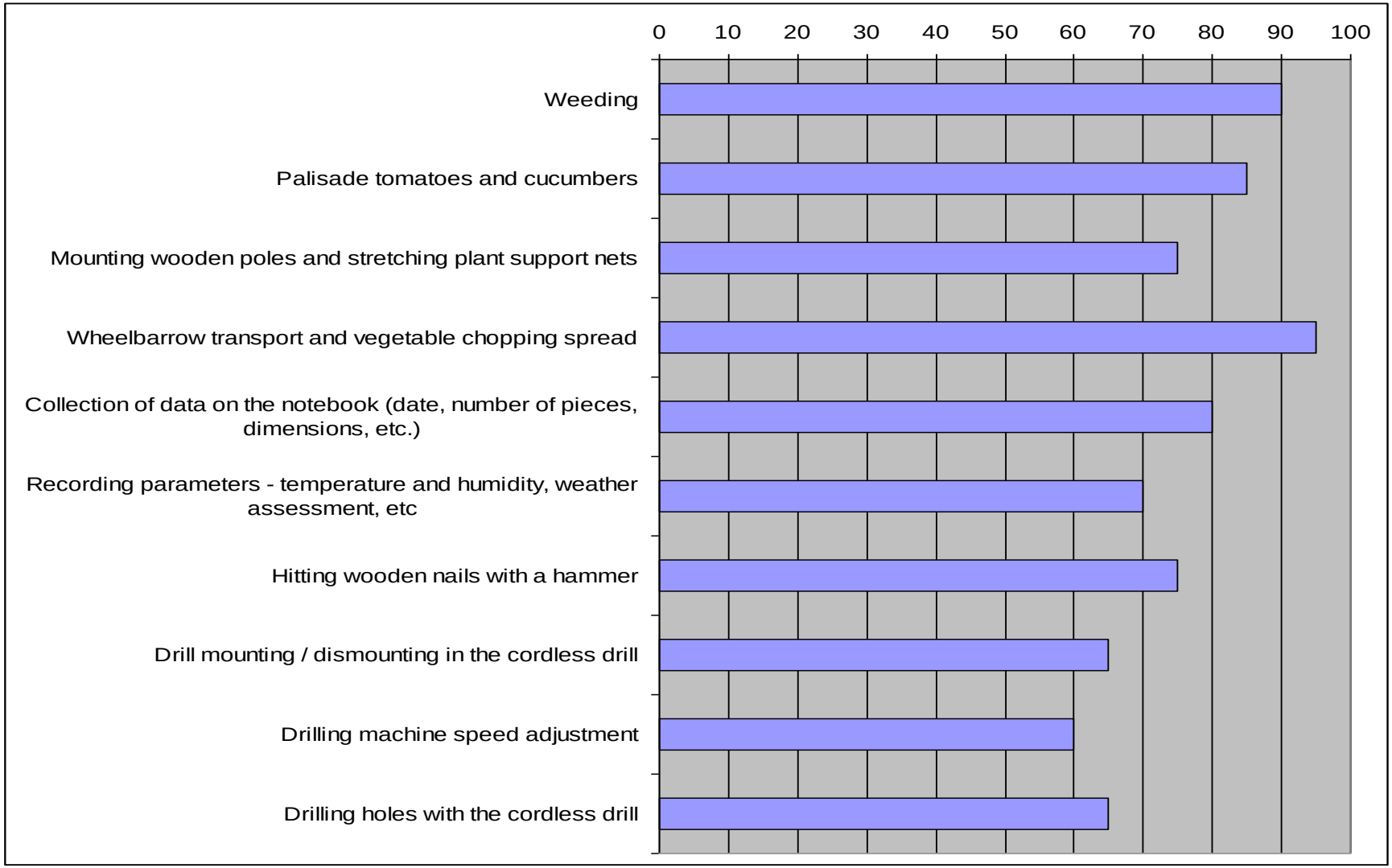

Results and discussions - Activity B - Practical tests
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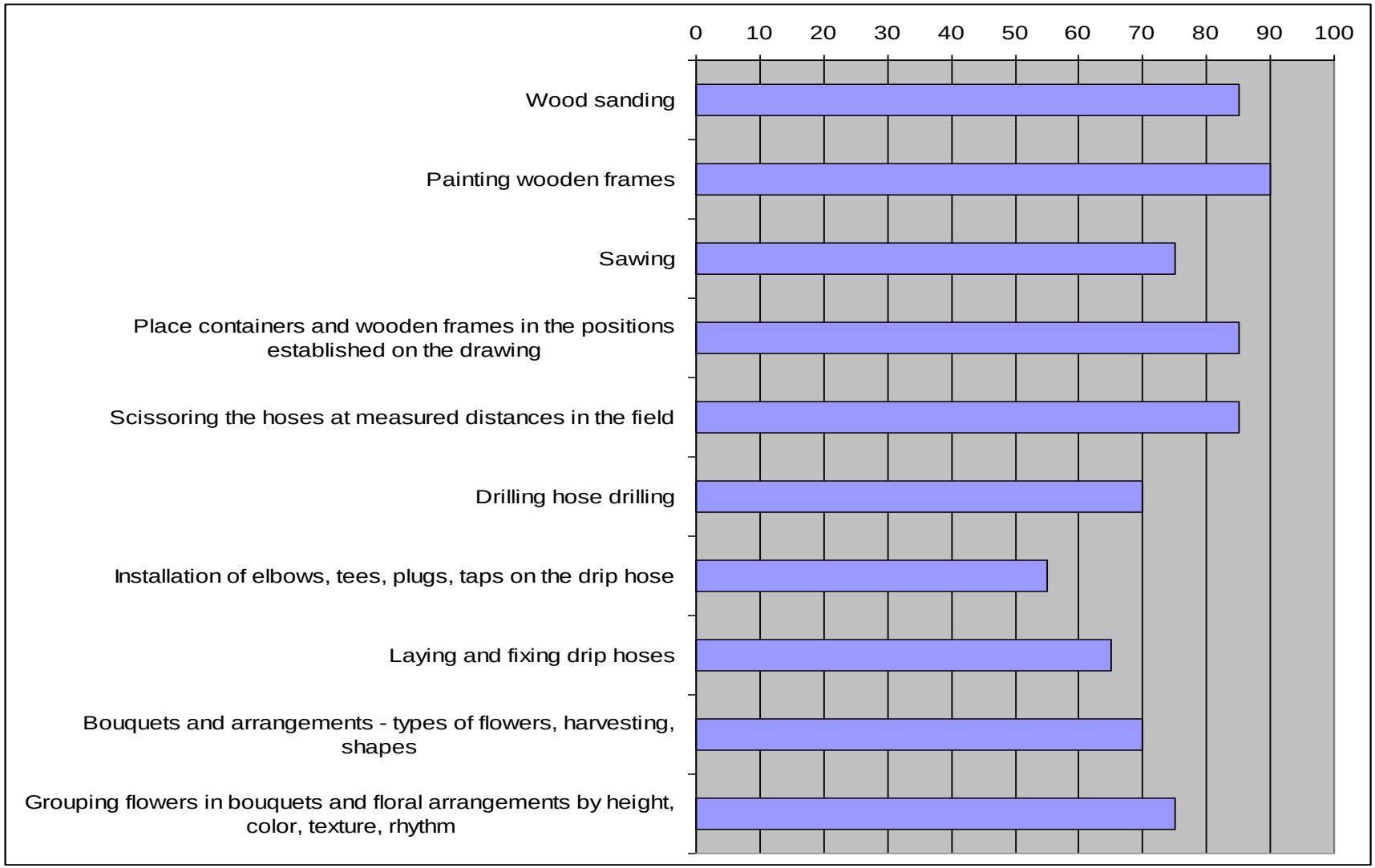
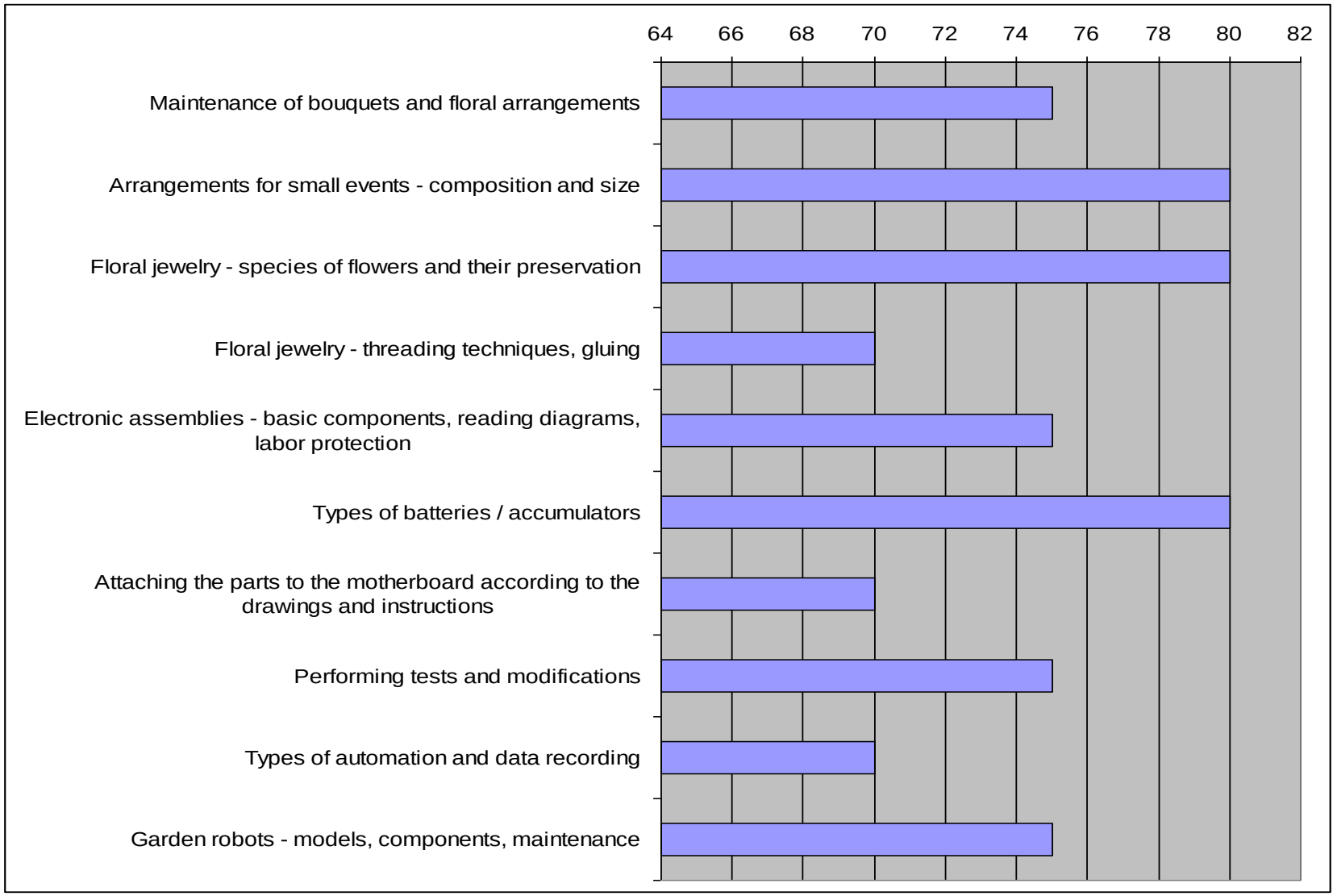


Results and discussions - Activity B - Practical tests
Children who have completed the tasks satisfactorily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Maintenance of bouquets and floral arrangements
Arrangements for small events - composition and size
Floral jewelry - species of flowers and their preservation
Floral jewelry - threading techniques, gluing
Electronic assemblies - basic components, reading diagrams, labor protection
Types of batteries / accumulators
Attaching the parts to the motherboard according to the drawings and instructions
Performing tests and modifications
Types of automation and data recording
Garden robots - models, components, maintenance

Conclusions and recommendations

The response received from the children after participating in these activities focused on gardening and horticulture was very positive.

Improvements were found in cognitive, emotional, behavioral and well-being.

The children had the opportunity to apply in practice the knowledge acquired at school, thus reducing functional illiteracy.

Conclusions and recommendations

Such programs must also be adapted to the constraints of pandemic situations, so that children are close to the garden even in difficult situations.

Container gardens located nearby or even in the house can be useful alternatives for children and adults.

The pattern of these gardens can be easily replicated in many parts of the world and in various communities.

Conclusions and recommendations

We, as specialists in horticulture, through our knowledge and energy, as well as the use of modern technology, can and even must support the establishment of remote gardens, especially for disadvantaged communities, because there are children we can save just by from a few plants.

After all, horticulture is a model for the development and fulfillment of tomorrow's generation, of plants, but especially of people.

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